Unit 2 Test – Chemistry (Chemical Reactions)

23 K 15 T 12 C 24 A 72 Total

Your name: Answers

Part 1 – Multiple Choice: Select the best answer to each of the following questions. Write your answer on the blank space provided here.

1	2	3	4	5	6	7	8	9	10
E	C	C	A	B	A	B	C	D	E

1. Which of the following is exactly the same as O_2F_2?

a) OF
b) O_3F_3
c) O_4F_4
d) all of the above
e) none of the above

2. How many atoms of hydrogen are in ammonium sulfate, $(NH_4)_2SO_4$?

a) 2
b) 4
c) 8
d) 12
e) 42

10 K

3. $Ca + AgNO_3 \rightarrow Ca(NO_3)_2 + Ag$ is an example of which type of reaction?

a) synthesis
b) decomposition
c) single displacement
d) double displacement
e) combustion

4. Which of the following elements will replace cobalt in a single displacement reaction?

a) magnesium
b) nickel
c) hydrogen
d) (a) and (b)
e) (a), (b) and (c)

5. What is the correct formula for Ammonium Sulfide?

a) NH_4SO_3
b) $(NH_4)_2S$
c) $(NH_4)_2SO_4$
d) $(NH_4)_3SO_4$
e) NH_4S

6. Which of the following **does** dissolve in water?

a) $CuSO_4$
b) ZnS
c) $Ca_3(PO_4)_2$
d) AlF_3
e) AgI

7. What is the name of the compound PbO_2?

a) lead (II) oxide
b) lead (IV) oxide
c) lead dioxide
d) monolead oxide
e) lead oxygen

8. Which of the following is **hydrofluoric acid**?

a) H_2F
b) HFO_3
c) HF
d) H_3F_2
e) H_2OF

9. Which of the following contributes to making acid rain?

a) N_2
b) NH_3
c) HBr
d) SO_3
e) $Ca(OH)_2$

10. Which of the following combinations would give a neutralization reaction?

a) $LiOH + Ca(NO)_2$
b) $H_3PO_4 + CH_4$
c) $SCl_6 + BeF_2$
d) $Cu + AlF_3$
e) $HI + KOH$

11	12	13	14	15	16	17	18	---	---
C	E	D	B	E	A	C	B		

11. What is the only material in the world to have a pH of exactly 7?

a) tap water
b) spring water
c) distilled water
d) pool water, after you add pH pellets
e) urine

12. Which of the following is not a **base**?

a) NaOH
b) $Ca(OH)_2$
c) $Al(OH)_3$
d) LiOH
e) CH_3COOH

8 K

13. Which of the following are products of **combustion** reactions?

a) CO_2
b) H_2O
c) O_2
d) (a) and (b)
e) (a), (b) and (c)

14. Which of the following does **not** characterize ionic compounds?

a) Usually solid
b) Conducts electricity as a solid
c) Conducts electricity when dissolved in water
d) High melting point
e) Soluble in water

15. What are the products of this neutralization reaction: $NaOH + H_2SO_4 \rightarrow$

a) H_2O and $NaSO_4$
b) H_2OH and $NaSO_4$
c) NaH_2 and $OHSO_4$ (also known as HSO_5)
d) H_2O, Na and SO_4
e) H_2O and Na_2SO_4

16. Which of the following does not represent an **acidic** pH?

a) 8
b) 6
c) 1
d) 0
e) -1

17. How many atoms of hydrogen (H) are in a molecule of NH_4CH_3OO?

a) 3
b) 4
c) 7
d) 12
e) 43

18. Balance this reaction (no fractions allowed):

$3\,Pb + 2\,N_2 \rightarrow \quad Pb_3N_4$

What is the coefficient on N_2?

a) 1
b) 2
c) 3
d) 4
e) 5

Part 2 – Naming

Write the proper name for each of the following compounds in the space provided.

K_3P	potassium phosphide	SCl_2	sulfur dichloride
CuO	copper (II) oxide	NH_4F	ammonium fluoride
$Fe_2(SO_4)_3$	iron (III) sulfate	$FePO_4$	iron (III) phosphate
$Al(CN)_3$	aluminum cyanide	CO	carbon monoxide
CaS	calcium sulfide	O_2F_2	dioxygen difluoride
N_2O_5	dinitrogen pentaoxide	$Co_2(CO_3)_3$	cobalt (III) carbonate

2 A

2. Write the chemical formula for each of the following compounds in the space provided.

lithium hydride	LiH	ammonium carbonate	$(NH_4)_2CO_3$
lead (IV) sulfide	PbS_2	calcium sulfide	CaS
cobalt (II) phosphate	$Co_3(PO_4)_2$	barium carbonate	$BaCO_3$
sodium nitride	Na_3N	nitrogen triiodide	NI_3
tetraphosphorous decaoxide	P_4O_{10}	iodine pentafluoride	IF_5
hydrofluoric acid	HF	copper (II) chloride	$CuCl_2$

12 A

Part 3 – Short Answer

1. Describe the error in each of the following chemical formulas. Then, write the correct formula.

a) Copper (II) Chloride, CuCl
no subscripts

$Cu^{2+}\ Cl^{-} \rightarrow CuCl_2$

4 C

b) Rubidium Nitrate, Rb_3N
↑ nitride

$Rb^{+}\ NO_3^{-} \rightarrow RbNO_3$

2. Label each of the following chemical reactions as synthesis, decomposition, combustion, single displacement, or double displacement.

$2AgNO_3 + Cu \rightarrow Cu(NO_3)_2 + 2Ag$ Single

$4\ C_{17}H_{37}O_3 + 99\ O_2 \rightarrow 34\ CO_2 + 74\ H_2O$ Comb.

5 K $P_4 + 3S_2 \rightarrow 2P_2S_3$ Syn

$BaCl_2 + Li_2CO_3 \rightarrow BaCO_3 + 2LiCl$ Double

$CaCO_3 \rightarrow CaO + CO_2$ Dec

3. Balance each of the following chemical reactions:

a) 6 NaBr + 1 $Pb_3(PO_4)_2$ → 3 $PbBr_2$ + 2 Na_3PO_4

b) 2 Mn + 6 HI → 3 H_2 + 2 MnI_3

6 T

c) 4 Re + 7 O_2 → 2 Re_2O_7

d) 1 As_4S_6 + 9 O_2 → 1 As_4O_6 + 6 SO_2

4. You have heartburn, which is when HCl from your stomach begins to burn your esophagus. You have two things in your medicine cabinet: $Mg(OH)_2$ or H_2CO_3. Which should you take? Write a complete (and balanced) chemical reaction for the neutralization of the acid.

3 C

$2HCl + Mg(OH)_2 \rightarrow MgCl_2 + 2H_2O$

5. Predict the products of the following chemical reactions. You do not have to balance them. If no reaction will occur, write "NR".

a) $Sn + CuSO_4 \rightarrow$ $SnSO_4$ or $Sn(SO_4)_2$ $+ Cu$

b) $HgNO_3 + K \rightarrow$ $KNO_3 + Hg$

5 T

c) $FeCl_3 + Na \rightarrow$ $NaCl + Fe$

6. Predict whether a solid precipitate will form when the following compounds are mixed. Circle your choice.

a) $NaOH_{(aq)} + CaBr_{2(aq)} \rightarrow$ Yes (No)

b) $Pb(NO_3)_{2(aq)} + HCl_{(aq)} \rightarrow$ (Yes) No

4 T

c) $AgNO_{3(aq)} + CuSO_4 \rightarrow$ (Yes) No

d) $LiNO_{3(aq)} + Na_3PO_{4(aq)} \rightarrow$ (Yes) No